



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION IV
1600 E. LAMAR BLVD.
ARLINGTON, TX 76011-4511

May 16, 2017

Mr. Eric Larson, Site Vice President
Entergy Operations, Inc
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, MS 39150

SUBJECT: GRAND GULF NUCLEAR STATION – NRC TEAM INSPECTION REPORT
05000416/2017010

Dear Mr. Larson:

On March 10, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Grand Gulf Nuclear Station. On April 27, 2017, the NRC inspectors discussed the results of this inspection with Mr. Greg Hawkins, Director, Regulatory Assurance and Performance Improvement, and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

The inspection examined activities conducted under your license as they relate to the implementation of mitigation strategies and spent fuel pool instrumentation orders (EA-12-049 and EA-12-051) and Emergency Preparedness Communication, Staffing, and Multi-Unit Dose Assessment Plans, your compliance with the Commission's rules and regulations, and your compliance with the conditions of your operating license. Within these areas, the inspection involved examination of selected procedures and records, observation of activities, and interviews with station personnel.

The NRC inspectors did not identify any findings or violations of more than minor significance associated with this inspection.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public Inspections, Exemptions, Requests for Withholding," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public

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Sincerely,

/RA/

Jason Kozal, Branch Chief
Project Branch C
Division of Reactor Projects

Docket No. 50-416
License No. NPF-29

Enclosure:
Inspection Report 05000416/2017010
w/ Attachment: Supplemental Information

GRAND GULF NUCLEAR STATION, UNIT 1 – NRC TEAM INSPECTION REPORT
05000416/2017010 – DATED MAY 16, 2017

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U.S. NUCLEAR REGULATORY COMMISSION

REGION IV

Docket: 05000416
License: NPF-29
Report: 05000416/2017010
Licensee: Entergy Operations, Inc.
Facility: Grand Gulf Nuclear Station, Unit 1
Location: 7003 Baldhill Road
Port Gibson, MS 39150
Dates: March 6 – 10, 2017
Inspectors: R. Alexander, Sr. Project Engineer (Team Leader)
N. Day, Resident Inspector
M. Stafford, Project Engineer
T. Sullivan, Project Engineer
Approved By: Jason Kozal
Chief, Project Branch C
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000416/2017010; 03/06/2017 – 03/10/2017; Grand Gulf Nuclear Station; Temporary Instruction 2515/191, Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, issued December 23, 2015.

The inspection activities described in this report were performed between March 6 and March 10, 2017, by a resident inspector at Grand Gulf Nuclear Station and three inspectors from the Region IV office. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

A. NRC-Identified and Self-Revealing Findings

None

B. Licensee-Identified Violations

None

REPORT DETAILS

4. Other Activities

4OA5 Other Activities (TI 2515/191)

The objective of Temporary Instruction (TI) 2515/191 “Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans” is to verify that licensees have adequately implemented the mitigation strategies as described in the licensee’s Final Integrated Plan (ADAMS Accession No ML16145A523) and the NRC’s plant safety evaluation (ADAMS Accession No. ML16253A322) and to verify that the licensees installed reliable water-level measurement instrumentation in their spent fuel pools. The purpose of this TI is also to verify the licensees have implemented Emergency Preparedness (EP) enhancements as described in their site-specific submittals and NRC safety assessments, including multi-unit dose assessment capability and enhancements to ensure that staffing is sufficient and communications can be maintained during such an event.

The inspection verified that plans for complying with NRC Orders EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (ADAMS Accession No. ML12229A174) and EA-12-051, Order Modifying Licenses With Regard to Reliable Spent Fuel Pool Instrumentation (ADAMS Accession No. ML12056A044) are in place and are being implemented by the licensee. Additionally, the inspection verified implementation of staffing and communications information provided in response to the March 12, 2012 request for information letter and multi-unit dose assessment information provided per COMSECY-13-0010, Schedule and Plans for Tier 2 Order on Emergency Preparedness for Japan Lessons Learned, dated March 27, 2013 (ADAMS Accession No. ML12339A262).

The team discussed the plans and strategies with plant staff, reviewed documentation, and where appropriate, performed plant walk downs to verify that the strategies could be implemented as stated in the licensee’s submittals and the NRC staff-prepared safety evaluation. For most strategies, this included verification that the strategy was feasible, procedures and/or guidance had been developed, training had been provided to plant staff, and required equipment had been identified and staged. Specific details of the team’s inspection activities are described in the following sections.

1. Mitigation Strategies for Beyond-Design-Basis External Events

a. Inspection Scope

The team examined the licensee’s established guidelines and implementing procedures for the beyond-design-basis mitigation strategies. The team assessed how the licensee coordinated and documented the interface/transition between existing off-normal and Emergency Operating Procedures with the newly developed mitigation strategies. The team selected a number of mitigation strategies and conducted plant walk downs with licensed operators and responsible plant staff to assess: the adequacy and completeness of the procedures; familiarity of operators with the procedure objectives

and specific guidance; staging and compatibility of equipment; and the practicality of the operator actions prescribed by the procedures, consistent with the postulated scenarios.

The team verified that a preventive maintenance program had been established for the FLEX portable equipment and that periodic equipment inventories were in place and being conducted. Additionally, the team examined the introductory and planned periodic/refresher training provided to the Operations and Security staffs most likely to be tasked with implementation of the FLEX mitigation strategies. The team also reviewed the introductory and planned periodic training provided to the Emergency Response Organization personnel.

b. Assessment

Based on samples selected for review, the inspectors verified that the licensee satisfactorily implemented appropriate elements of the FLEX strategy as described in the plant specific submittals and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-049. The inspectors verified that the licensee satisfactorily:

- Developed and issued FLEX Support Guidelines (FSG) to implement the FLEX strategies for postulated external events;
- Integrated their FSGs into their existing plant procedures such that entry into and departure from the FSGs are clear when using existing plant procedures;
- Protected FLEX equipment from site-specific hazards;
- Developed and implemented adequate testing and maintenance of FLEX equipment to ensure their availability and capability;
- Trained their staff to assure personnel proficiency in the mitigation of beyond-design-basis events; and
- Developed means to ensure that the necessary off-site FLEX equipment will be available from off-site locations.

The inspectors verified that any non-compliances with current licensing requirements and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings were identified.

2. Spent Fuel Pool (SFP) Instrumentation

a. Inspection Scope

The team examined the licensee's newly installed spent fuel pool instrumentation. Specifically, the inspectors verified the sensors were installed as described in the plant specific submittals and the associated safety evaluation and that the cabling for the power supplies and the indications for each channel are physically and electrically separated. Additionally, environmental conditions and accessibility of the instruments were evaluated.

b. Assessment

Based on samples selected for review, the inspectors determined that the licensee satisfactorily installed and established control of the SFP instrumentation as described in the plant specific submittals and the associated safety evaluation and determined that the licensee is generally in compliance with NRC Order EA-12-051. The inspectors verified that the licensee satisfactorily:

- Installed the SFP instrumentation sensors, cabling and power supplies to provide physical and electrical separation as described in the plant specific submittal and safety evaluation;
- Installed the SFP instrumentation display in the location, environmental conditions, and with the accessibility as described in the plant specific submittals; and
- Trained their staff to assure personnel proficiency with the maintenance, testing, and use of the SFP instrumentation.

The inspectors verified that any non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings were identified.

3. Staffing and Communication Request for Information

a. Inspection Scope

Through discussions with plant staff, review of documentation, and plant walk downs, the team verified that the licensee has implemented required changes to staffing, communications equipment and facilities to support an Extended Loss of All AC Power (ELAP) scenario as described in the licensee's staffing assessment and the NRC safety assessment. The team also verified that the licensee has implemented dose assessment (including releases from spent fuel pools) capability using the licensee's site-specific dose assessment software and approach as described in the licensee's dose assessment submittal.

b. Assessment

The inspectors reviewed information provided in the licensee's multi-unit dose submittal and in response to the NRC's March 12, 2012, request for information letter. The inspectors verified that the licensee satisfactorily implemented enhancements pertaining to Near-Term Task Force Recommendation 9.3 response to a large scale natural emergency event that results in an ELAP scenario to the site and impedes access to the site.

The inspectors verified the following:

- The licensee satisfactorily implemented required staffing change(s) to support an ELAP scenario;
- Emergency preparedness communications equipment and facilities are sufficient for dealing with an ELAP scenario; and
- Dose assessment capabilities (including releases from spent fuel pools) using the licensee's site-specific dose assessment software and approach.

The inspectors verified that any non-compliances with current licensing requirements, and other issues identified during the inspection were entered into the licensee's corrective action program.

c. Findings

No findings were identified.

40A6 Meetings, Including Exit

Exit Meeting Summary

On March 10, 2017, the inspectors presented the inspection results in a management debrief to Mr. B. Roach, Senior Manager, Site Projects and Nuclear Services, and other members of the site staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection. The inspectors completed an exit meeting conducted with Mr. G. Hawkins, Director, Regulatory and Performance Improvement, and other members of the site staff, via telephone on April 27, 2017, to discuss the final results of the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

C. Bottemiller, Entergy Corporate Licensing
T. Coutu, Director, Regulatory Assurance and Performance Improvement
J. Dorsey, Manager, Security
D. Ellis, Senior Emergency Planner, Emergency Preparedness
V. Fallacara, Acting Site Vice President
B. Flowers, FLEX Marshal, Operations
M. Greenough, Design Engineer, Engineering
F. Gynn, Project Manager, Entergy Corporate Fukushima Projects
G. Hawkins, Director, Regulatory Assurance and Performance Improvement
R. Meyer, Shift Manager, Operations
J. Nadeau, Manager, Regulatory Assurance
B. Roach, Senior Manager, Site Projects and Nuclear Services
C. Roberts, Procedure Writer, Operations
S. Sweet, Licensing Engineer, Regulatory Assurance
F. Weaver, Shift Manager, Operations Training
B. Wentz, Senior Manager, Operations

NRC Personnel

M. Young, Senior Resident Inspector

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

2515/191	TI	Inspection of the Implementation of Mitigation Strategies and Spent Fuel Pool Instrumentation Orders and Emergency Preparedness Communication/Staffing/Multi-Unit Dose Assessment Plans, issued December 23, 2015
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LIST OF DOCUMENTS REVIEWED

Section 40A5: Other Activities

Corrective Action Documents (CR-GGN-)

2015-06134	2016-02246	2016-04372	2016-06961	2016-07339
2016-07383	2016-07408	2016-08592	2017-01846	2017-02030
2017-02062	2017-02063	2017-02165	2017-02159	2017-02181
2017-02265	2017-02197	2017-02289*	2017-02292*	2017-02298*
2017-02439*	2017-02306*	2017-02342	2017-02344*	2017-02384*
2017-02390*	2017-02410*	2017-02412*	2017-02440*	2017-02441*
2017-02442*	2017-02444*	2017-02446*	2017-02460*	2017-02465*
2017-02467*	2017-02500*	2017-03096*	2017-03294*	

* - indicates condition report written by the licensee as a result of the NRC inspection

Drawings

<u>Number</u>	<u>Title</u>	<u>Revision</u>
C0020	Site and Yard Work Erosion Control and Generator Site Drainage Plan	20
C7639	Flex Storage Building Equipment Layout	0
C7640	Grading and Drainage Plan for Flex Storage Building Site 1	NEW
C7641	Flex Storage Building Site 4	NEW
C7643	Flex Storage Buildings Deployment Paths Outside PA	0
C7652, SH 3	Flex Storage Building Site Plan	NEW

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
02-S-01-35	Outside Rounds	81
04-1-01-P41-1	Standby Service Water System	143
04-1-03-A30-1	Cold Weather Protection	23
05-1-02-I-4	Loss of AC Power	50
05-1-02-I-7	Extended Loss of AC Power (ELAP)	0
05-1-02-VI-2	Hurricanes, Tornadoes and Severe Weather	130
05-S-01-FSG-001	Long Term Reactor Vessel Cooling	1

Procedures

<u>Number</u>	<u>Title</u>	<u>Revision</u>
05-S-01-FSG-002	Alternate RCIC Suction Source	1
05-S-01-FSG-003	Alternate Reactor Vessel Cooling	0
05-S-01-FSG-004	ELAP DC Bus Load Shed and Management	0
05-S-01-FSG-005	Initial Assessment and FLEX Equipment Staging	0
05-S-01-FSG-007	Loss of Control/Instrumentation Power	0
05-S-01-FSG-011	Alternate Spent Fuel Pool Makeup and Cooling	1
05-S-01-FSG-012	Alternate Containment Cooling and Hydrogen Control	0
05-S-01-FSG-013	Transition from FLEX Equipment	0
05-S-01-FSG-100	Beyond Design Bases External Event (BDBEE) with an Extended Loss of Offsite and Onsite Power (ELAP) Emergency Response	0
05-S-01-FSG-101	Emergency Communication for Beyond Design Basis External Events	1
EN-DC-324	Preventive Maintenance Program	17
EN-EP-313	Offsite Dose Assessment Using the Unified RASCAL Interface	0
EN-HU-106	Procedure and Work Instruction Use and Adherence	3
EN-LI-102	Corrective Action Program	27
EN-MA-101-03	Maintenance Work Preparation Process	7
EN-OP-104	Operability Determination Process	11
EN-OP-201-02	Grand Gulf Nuclear Station FLEX Program Document	0

Work Orders

<u>Number</u>	<u>Title</u>	<u>Revision / Date</u>
416741-01	Model Work Order (MWO) 416741-01 1FLEXC001 pump 6 month	
416742-01	MWO 416742-01 1FLEXC002 pump 6 month	
416743	MWO 416743 1FLEXC001 oil sample 1 year	
416744	MWO 416744 1FLEXC002 oil sample 1 year	
416745	MWO 416745 1FLEXC001 pump 1 year	
416746	MWO 416746 1FLEXC002 pump 1 year	
416786-01	MWO 416786-01 1FLEXS009 diesel gen 6 month	

Work Orders

<u>Number</u>	<u>Title</u>	<u>Revision / Date</u>
416787-01	MWO 416787-01 1FLEXS010 diesel gen 6 month	
416788	MWO 416788 1FLEXS009 oil sample 1 year	
416789	MWO 416789 1FLEXS010 oil sample 1 year	
416790-01	MWO 416790-01 1FLEXS009 diesel gen 1 year	
416791-01	MWO 416791-01 1FLEXS010 diesel gen 1 year	
417790-01	MWO 417790-01 1FLEXS011 diesel gen 6 month	
417791	MWO 417791 1FLEXS011 oil sample 1 year	
417792	MWO 417792 1FLEXS011 diesel gen 1 year	
443343-01	MWO 443343-01 1FLEXS022 diesel gen 6 month	
443419	MWO 443419 1FLEXS022 oil sample 1 year	
443436	MWO 443436 1FLEXS022 diesel gen 1 year	
445390-01	MWO 445390-01 1FLEXC001 pump 1 month	
445390-07	MWO 445390-07 1FLEXS009 diesel gen 1 month	
445390-08	MWO 445390-08 1FLEXS011 diesel gen 1 month	
445483-01	MWO 445483-01 1FLEXC002 pump 1 month	
445483-07	MWO 445483-07 1FLEXS010 diesel gen 1 month	
445483-09	MWO 445483-09 1FLEXS022 diesel gen 1 month	
471187-01	FLEX Standby PM – 1 Year Operational Test – 1FLEXS011	March 30, 2017
52684632-01	FLEX Standby PM – 1 Year Operational Test – 1FLEXS011	March 22, 2017
52688177-01	1FLEXS022 FLEX Standby PM – 1 Year Operational Inspection	March 21, 2017

Calculations

EC 50275	EC 50287	EC 64812	CC-N1FLEX- 14002
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Miscellaneous Documents/Reports

<u>Number</u>	<u>Title</u>	<u>Revision / Date</u>
	EOF Inventory/Operability Check/Housekeeping Inspection	(Not Dated)
	GGNS EOF Inventory Sheet FLEX Equipment	(Not Dated)

Miscellaneous Documents/Reports

<u>Number</u>	<u>Title</u>	<u>Revision / Date</u>
	Entergy GGNS FLEX Validation	February 5, 2016
	Grand Gulf Station On-Shift Staffing Analysis, Final Report	December 13, 2012
	SFPI Conduit Separation White Paper	(Not Dated)
06-IC-1G41-A-0001	SFP Level Instrument Channel Functional Test	100
GGNS-SA-14-00002	Further Development of Grand Gulf FLEX Strategy Analytical Bases and Conceptual Design	0
GGNS-SA-15-00001	SAFER Response Plant for Grand Gulf Nuclear Station	1
GNRO-2015/00054	Response to March 12, 2012, Request for Information (RFI) Pursuant to Title 10 of the Code of Federal Regulation 50.54(f) Regarding Recommendations of the Near-Term Task Force (NTTF) Review of Insights from the Fukushima Dai-ichi Accident, Enclosure 5 Recommendation 9.3, Emergency Preparedness - Staffing, Requested Information Items 1, 2 and 6 - Phase 2 Staffing Assessment	October 21, 2015
SDC-P41	System Design Criteria for Standby Service Water System P41	4